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AUTHOR Grimes, Joe; Zingg, Paul; Hanley, Jerry
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ABSTRACT

The teaching/learning process must drive technology planning. Over the past several years an effort at California Polytechnic State University has been underway to ensure that the culture of participatory and strategic governance promotes this principle, with both the users and the providers being of the same understanding and participating as part of the same team. The key to a successful effort is informed, engaged, and supportive institutional leadership. This paper explains how this process has evolved, describing a process of continually advancing a user-defined strategic goals document with general categories of Access, Integration, Skills, Simplicity, and Process.' (Author/AEF)

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User Empowered Process for Information Technology Planning and Implementation

ED 450 719

Joe Grimes
Chair, Instructional Advisory Committee on Computing
Director, Computer Engineering Program
California Polytechnic State University
San Luis Obispo, California
(805)756-2088
(805)756-2956
jgrimes@calpoly.edu

Paul Zingg,
Provost and Academic Vice President
California Polytechnic State University
San Luis Obispo, California
(805)756-2186
(805)756-5292
pzingg@calpoly.edu

Jerry Hanley
Vice Provost/CIO Information Technology Services
California Polytechnic State University
San Luis Obispo, California
(805)756-5541
(805)756-2000
jhanley@calpoly.edu

C.J. Keller

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Abstract

The teaching/learning process must drive technology planning. Over the past several years an effort at Cal Poly has been under way to ensure that the culture of participatory and strategic governance promotes this principle, with both the users and the providers being of the same understanding and participating as part of the same team. The key to a successful effort is informed, engaged, and supportive institutional leadership. This presentation will show how this process has evolved, describing a process of continually advancing a user-defined strategic goals document with general categories of Access, Integration, Skills, Simplicity, and Process.

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Introduction

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The responsibility of meeting the instructional information technology requirements of a university is much like the responsibility of exploring a new frontier. It is exciting; there are unknowns; there are hazards, and success brings an adrenaline surge to advance the frontier even further. In this paper, we address the components that we believe must be present in order to fulfill campus requirements for information technology in the teaching/learning process. We also will address the roles and responsibilities of each of the leaders in achieving real success in such a critical effort: the chief academic liaison, the chief information officer, and chief academic officer. We will look at where we began, where we are today, and the vision for the future. What will be said may seem obvious, but it is our belief that some insights can be gained from understanding how such efforts will succeed when

aligned and interrelated through the specific use of defined processes and explicit committee structures.

Cal Poly is a comprehensive residential university with 15,000 full time equivalent students with Colleges of Agriculture, Architecture and Environmental Design, Business, Engineering, Liberal Arts, and Science and Mathematics. The campus has several related and pivotal campus committees which are concerned with the uses of IT and the resources that support them: Instructional Advisory Committee on Computing (IACC), Administrative Advisory Committee on Computing, and Information Resource Management Policy and Planning Committee, which provide recommendations regarding technology planning, policy, and implementation of the information technology requirements of the campus. The University has an "Instructional Computing Strategic Goals" (URL: http://www.multimedia.calpoly.edu/iacc/goals.html) document and an "Administrative Computing Strategic Goals" document which are used as a basis for planning and determining projects to be started. Both are revised periodically, and are designed to be both strategic and operational in their development and uses. The campus is significantly influenced by and also influences what happens at the California State University system level because of its current and historical leadership role within the CSU.

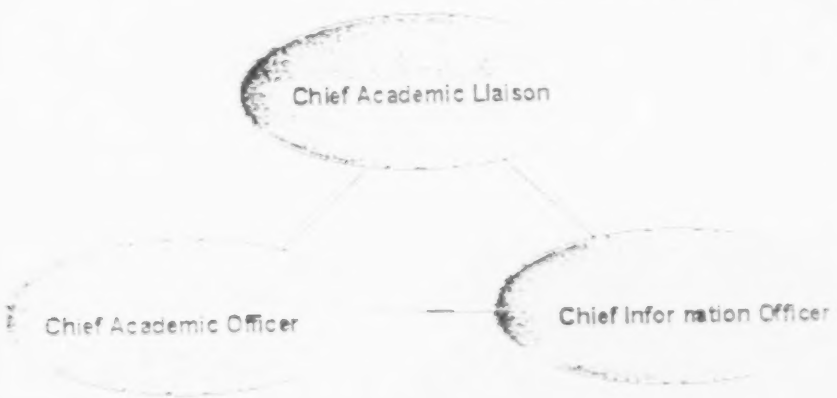
Requirements for a Successful Information Technology Process

The components of an environment that encourages participatory and strategic governance include a culture of trust and communication, and widespread agreement with the principle that teaching and learning processes must drive technology planning. At Cal Poly this kind of environment has been evolving as role clarity, mutually developed requirements, and increasingly explicit shared processes for governance and discourse have been refined. This balance is best described through the metaphor of a three legged stool, (see Figures 1 & 2,) which reflects what Cal Poly has developed a "system" which has several essential characteristics present and supported by the Chief Academic Liaison (CAL), the Chief Information Officer (CIO), and Chief Academic Officer (CAO).

Principle One: Trust, cooperation, and open communication must exist and be clearly demonstrated

The goal of these three individuals must be to provide leadership in the process of defining and meeting campus-wide academic information technology requirements. The leaders must be informed, engaged, and supportive and share a common vision and commitment to assign resources and their personal attention to what the process develops and recommends. It is essential that the leaders integrate planning and implementation in the technology area with those that are occurring in all other areas of discourse relating to the teaching/learning process of the University.

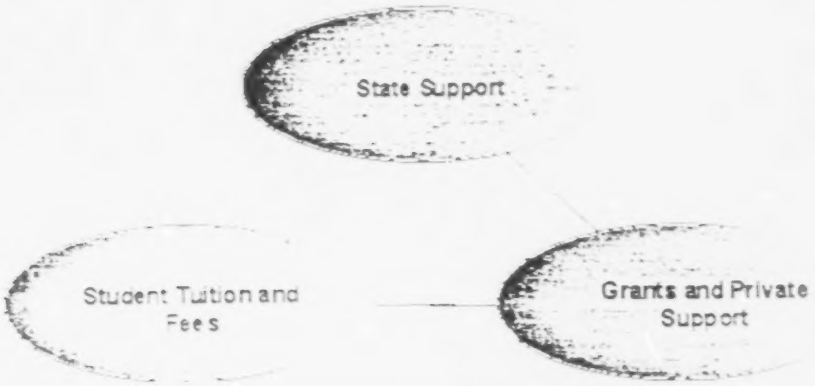
Figure 1 The Three Legged Stool of Trust, Cooperation, and Communication



Principle Two: Appropriate financial support must exist

A second key factor for a successful process for providing information technology resources is appropriate financial support. This will be realized if the three legged stool (Figure 2) of state support, student fees and tuition, and grants and private support is balanced and delivers the critical mass of financial support and resources to advance the agreed to agenda. At Cal Poly we are investing considerable effort to insure that the annual budget is "the arithmetic expression of the plan" and that, as such, it is clearly derived from the initiatives which have been agreed to and which are core to the goals and strategies developed within the committee process. Accordingly, the budget must be open, available, and thoroughly understood by the Chief Academic Liaison, the Chief Information Officer, and Chief Academic Officer.

Figure 2 The Three Legged Stool of Financial Support



Best Practices can flourish in this well supported environment:

Investing in these two critical principles of "infrastructure" creates the culture and context to make real impact on developing and using the "best practices" that promote a wise use of IT in support of the core teaching and learning mission of the university. The practices address both the use of IT as it directly enables faculty to innovate in the classroom and other learning situations, but also in how to make the communications and support processes that foster change work as well. Our experience with some selected best practices include:"

- Using technology to implement the AAHE Principles for Good Practice in Undergraduate Education (URL:http://www.aahe.org/technology/ehrmann.htm) as they apply to Cal Poly.
- Access throughout the campus to key campus resources such as budgets, IT implementation plans for the campus, and other visionary plans for the campus.
- Explicit support for Innovative and empowered faculty and staff.
- Multidisciplinary initiatives.
- A process or processes for deciding and carrying forth initiative, inclusive of funding. See guidelines in the Exhibit, which should be revised to strengthen the funding element. The initiatives require a closure of operational and budgetary elements aligned with resources.
- Culture of communication and loop closure. A yearly cycle of seeking guidance, acting on the advice received, and reporting back on the actions taken.
- Understanding of the History of Information Technology on Campus.
- Understanding the nature of the University.
- Capitalization on the strengths of the campus.
- Assuming planning and implementation are never ending.
- Establishing financial responsibility.

The Next Step is to create a closed loop system, informed by a well designed assessment process:

The process described in this section is illustrated in Figure 3. The diagram depicts the flow of information through the campus environment related to information technology planning. Constituents

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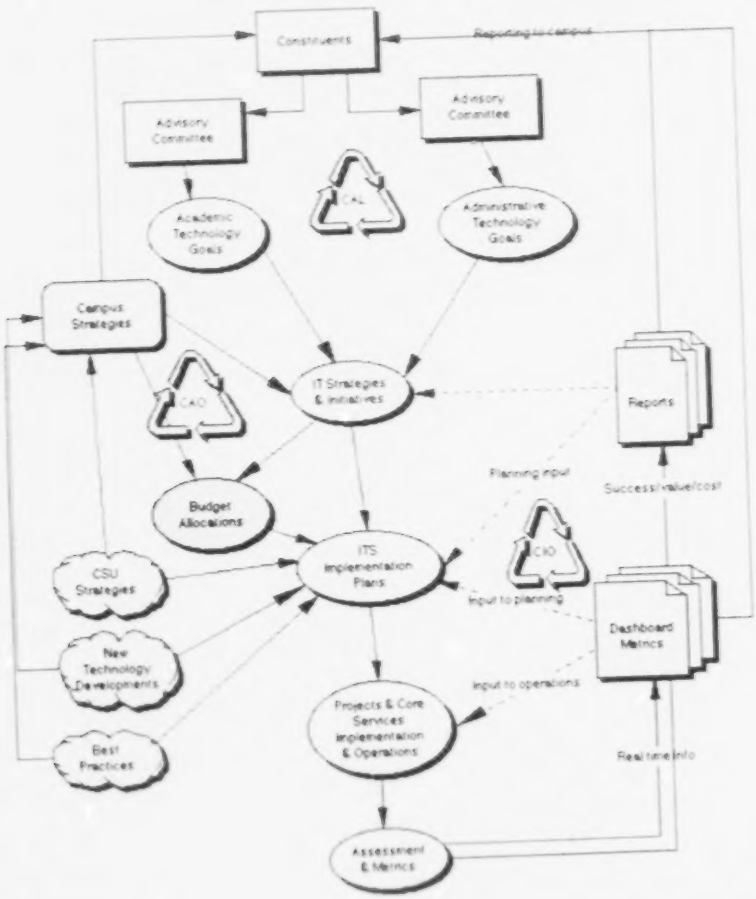
(faculty, students, and administrative offices) communicate with committees who represent their interests and act in an advisory role to Information Technology Services (ITS) and the CIO. The Campus Academic Liaison has primary responsibility for insuring that constituents and their representatives are able to voice their concerns and opinions. The CAL helps make explicit constituent concerns and needs in the annual review of academic technology goals. These goals are directly and explicitly incorporated into the development of ITS strategies and initiatives. This process is further illustrated in the case studies that follow.

The Chief Academic Officer insures that information from the external environment and other campus strategies related to the teaching and learning processes in particular, are included in the development of IT strategies and initiatives. Budget allocations are dependent in part on the degree of alignment between IT Strategies and Initiatives and the overall campus and CSU strategies.

The CIO seeks to define specific implementation plans and processes that give life to strategies and initiatives. Such implementation plans must seek a basis in the real life results of previous efforts, as reported via real-time "dashboard"metrics and more complicated, analytical assessments, as well as new technologies and discovery of best practices. The assessment and metrics elements of this information flow also provide valuable data for "tuning" operations and implementations as they are in process.

Figure 3 Campus Process



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Responsibilities of Chief Academic Liaison

The CAL has a role which is delightfully challenging, interesting, and essential to the success of technology planning and implementation for the campus. The key characteristics of the CAL are: integrity; the ability to engage the faculty, Deans, and other campus constituents to determine the campus requirements; knowledge of the learning process and the potential for technology to be applied to it; vision for the entire University; and a good understanding of the current availability of technology and its anticipated future paths. Most of all, the CAL must be keenly aware that: usually there are no simple solutions; that a prescriptive set of rules which will assure success to determine the correct solution and implementation path for the campus doesn't exist, and if one did exist, it would be in a constant state of flux; and finally, the best campus solution will not completely satisfy the requirements of anyone. The CAL must realize that success is a state of mind, not a place in time and that, as such, the process of setting and meeting intermediate step-wise results against broader goals is the key to achievement and progress.

The CAL must realize that the requirements for a successful information technology process will never be completely satisfied. Vigilance must be maintained in order to recognize what success means, and in order to continue moving toward that ever-changing definition of success.

Responsibilities of Chief Academic Officer

The CAO, the Provost on our campus, must act to insure that Information Technology is fully integrated into the strategic plan of the University and that the resources committed are focused and remain focused to serve means to other ends; specifically, the teaching and learning mission of the University. The concept of collegiality must be reinforced within the classic governance councils of the academy, especially for faculty, e.g. through wise Senate liaison, and with students, such that the "means to other more critical ends" is always in focus. The focus of such efforts must be to insure that accountability to teaching and learning, or service in support of teaching and learning, provides the basis of requirements and priorities that are then clearly articulated and regularly reported and communicated throughout the annual academic cycle.

Disciplines that tend to be strong(er) or more widely used in the world of IT, such as productivity analysis and measurement, and business case analysis of real costs and service or value delivery must be shared within the colleges, and the uses of such tools and processes encouraged and extended where sensible and practical to the core efforts of the Deans and Heads, Chairs, etc. for IT related, as well as other processes that serve the mission.

The CAO must be interested in how the incentives, recognition, and rewards systems that exist within the academy are made adaptable to the fundamental changes implicit in the increase of the uses of technology in support of sound and flexible pedagogies and the development of new/different forms of teaching achievement. A key point of emphasis is in fostering clarity as to what role faculty achievement in "mediated" or IT enhanced instruction, research, etc. should play in the RTP (retention, tenure, and promotion) process.

Finally, the CAO must be a concerned leader and change manager, who both through personal attention to the selection of key personnel and the empowerment of key processes, committees, and colloquia, expresses a personal commitment to guide how the institution addresses and benefits from the complex changes that IT fosters and occasions within our academic world.

Responsibilities of Chief Information Officer

The CIO responsibilities include defining the information technology vision for the campus, providing the leadership to insure successful implementations, and engaging the campus community in the planning, prioritization, and assessment phases of initiatives and projects. The CIO must help the campus develop, and then, promote a vision for the role of information technologies in supporting the core functions of the University, including the direct use of IT in instruction, the sustenance and

improvement of the processes underlying program support, and the development of a community of scholars.

The CIO must also provide leadership in how the campus understands the impact and leverage of IT innovations that are well suited to the core mission of the institution and in exposing the true costs and benefits of integrating information technologies towards the achievement of this core mission. One principal theme we seek to achieve results with is to deliver two forms of services; one that is core or "utility based" and driven by operational excellence at the infrastructure level, and one that is "client or user specific" and tied to the delivery needs or outcomes of specific campus constituents; e.g. access needs of faculty, IT-lab requirements of students. Here the goals and intent of our users, and the consultative committees play a significant role and present real opportunities for alignment. We refer to our goal to achieving progress with these two forms of service as creating "more chickens and more eggs" since there is a continuous interplay and need to strike a balance between what and how we extend core services and yet truly build responsiveness to individual and specific initiatives..

Change management is another critical element in the successful CIO's portfolio of responsibilities, both as an agent of change from within the IT profession, and as one of several campus leaders who must articulate how change is to occur, how it is to be funded, if/where resources are a key to the change, and what are the essentials that need to be supported at the professional and personal level from within all the constituent stakeholder groups (faculty, students, and staff). This is and will be a truly "engaging and empowering role" that is most demanding as progress is made and obstacles to progress intervene.

This position is responsible for insuring that full and open discussions take place in order to establish a common understanding of goals, and to enable open prioritization of implementation plans. The CIO must drive discussions at the campus management level, at the advisory committee level, and within the ITS organization to set priorities and reasonable expectations of progress and outcomes.

Finally, the CIO must insure that the ITS organization is agile, knowledgeable, well-trained, and able to work as a team to plan, implement, and support projects and services with a culture that is "customer responsive, on-time, on-spec, and on budget".

Case Studies

Case Study #1: Process for a Faculty Workstation Program (FWP)

The faculty workstation program has become a popular and highly respected program at Cal Poly. It includes a balance: recognizing that the instructional application should drive the solution; being financially responsible; meeting requirements of the faculty; being efficient to implement; providing incentive for best application of the equipment; the mechanism for determination of requirements; implementation does not create overhead for the faculty; and that guidelines used not become constraints to doing what is right. It has been essential that the leaders of Figure 1 understand and subscribe to these principles.

Prior to the 1996-1997 academic year, the University provided the network infrastructure for the campus, but each department provided desktop computers for its faculty. The IACC formed a consensus that faculty minimum workstation requirements were not being met and that the campus infrastructure support should be extended to include the faculty workstation. To launch the FWP, IACC proceeded to carry out the following activities (Documents are located at URL: http://www.multimedia.calpoly.edu/iacc/documents.html):

- Develop and perform a Faculty Workstation Plan Survey. This survey measured the specific workstation requirements of the faculty. It was determined that over half of the faculty had no workstation or had one that did not meet the minimum requirement.
- Develop a Faculty Workstation Plan. This plan consisted of two phases: Catch-up (year 1) and Sustenance of Currency (years following year 1.). The principles of this plan which were implemented contained provisions for hardware, software, support, and training. This plan and

subsequent revisions provided a balance between ideal platform and support requirements, such as common architecture, and simplicity of implementation, such as each college receiving one workstation for each full time equivalent faculty member.
- Sent a Faculty Workstation Memo to the President. This memo, with the faculty workstation plan attached, sought full support for the Faculty Workstation Program by the President. The request, contained in the memo, was approved by the President, and the first year of the program was the 1996-1997 academic year.

The initial plan was quite successful but has since has been enhanced in the following ways:

- Development of a FWP WWW site at URL: http://www.multimedia.calpoly.edu/iacc/resources.html
- Movement from a one-size-fits-all hardware solution to an application use based solution.
- Provision of individual support and training for faculty who wanted it, when they received a new workstation.
- Provision of additional software. A central software keyserver was implemented to provide less frequently used software for faculty as they need it.
- Recognition that the instructional staff needs to be compatible and current with the faculty. This has resulted in a consideration of how to best satisfy these staff workstation requirements. Departments were always allowed to purchase staff workstations under the FWP.
- It was extended to include library faculty, military science, and athletics.

Each year the campus attempts to enhance the program through a loop closing process in which information is collected, analyzed, and discussed, and the FWP modified as appropriate.

Case Study #II: Integrated Media Services (IMS)

As digital media became more prevalent and mainstream in the early 90's, the provision of media support services became fragmented as the traditional classroom support organization continued to focus on old technologies (overhead projectors, slide projectors, VCR's) while other organizations provided ill-defined, ad hoc support for early adopters of newer, digitally based technologies (computer-based presentations with data/video projectors, laptops, including projection of internet content). As the fragmented support evolved, several problems appeared:

- Ability to develop multimedia presentations was not accompanied by the infrastructure necessary to deliver them.
- Early adopters of digital media received more courseware development support than was justified by program and campus priorities.
- The perception developed that only faculty with grant funds could obtain courseware development support.
- There was insufficient classroom support for faculty using either old or new technology.

To address these and other related issues, the Provost appointed a Task Group to examine the role of Distributed and Distance Learning at Cal Poly. A subsequent Study Group evaluated the needs and opportunities for supporting the advancement of teaching and learning with particular attention being paid to the roles of information technology. Finally, the CIO and Provost convened a Charette to develop a strategy and design for distributed teaching and learning. These efforts produced recommendations that were included in the planning for the development of Integrated Media Services (see http://www.multimedia.calpoly.edu/ims/main.html) in 1997 to fulfill the recommendations regarding:

- Distance Learning and Videoconferencing.
- Media presentation.
- Leverage IT to provide interactivity, improve instruction and learning.
- Improve Access to anytime, from anywhere.
- Clear responsibilities and support levels.

The reorganization resulting in IMS was achieved by recombination of existing staff and units from within Information Technology Services (ITS):

- Audio-video Services.
- Videoconferencing Support.
- Faculty Multimedia Development Center.
- Webmaster.

IMS now consists of three groups:

- **Media Application Services**. This group provides: a media development laboratory for faculty and approved students to use in development of faculty projects; provides an RFP process for faculty proposals for development of projects; provides access to training and ongoing support for CourseInfo; a course management and delivery system for web-based courses; in conjunction with the library provides faculty orientation, encouragement, training, and development support; and in cooperation with Media Distribution Services develops distance education materials.
- **Media Distribution Services.** MDS designs and supports electronic classrooms that can deliver instructional materials designed, developed or supported by MAS; provides a refresh schedule for aging, obsolete, broken, and unused hardware; provides video support; and maintains and operates the synchronous distance learning technologies.
- **Web Services Group (WSG).** The WSG provides web site design, development, maintenance and hosting services for campus organizations and units (not individual web sites or course web sites). These services are offered on a cost-recovery basis so that units unable or uninterested in staffing or hosting their own web site may still have a presence on the web that is of a professional, production quality. The WSG maintains and coordinates the campus web site, coordinating with offices all over campus to keep content current and accurate.

The guiding principle of IMS is to provide integrated, end to end service and support, aiding faculty in developing instructional materials (e.g., overhead transparencies, 35mm slides, PowerPoint presentations, web-based courseware, CD-ROM based course materials, video clips) to delivery in the classroom, via the web or via simultaneous audio/video distance learning modes.

IMS is in its infancy and its major efforts in the future will be to find the resources necessary to carry out its responsibilities and make service available and equally to all faculty.

Roles CAL, CIO, and CAO in FWP and IMS

The CAL function has been very successful in working with the CAO and CIO to provide forums for discussion of issues and requirements. We have inaugurated the discipline of an annual review meeting with the ITS organization which offers the opportunity for faculty representatives to express their instructional support needs and requirements to ITS and for key IT staff to engage in real time mutual dialog on results, expectations and strategies in support of goals. In addition, weekly meetings offer ITS staff the opportunity to hear of new needs and requirements, as well as dashboard information on how current programs are being received and interpreted. In addition to weekly meetings with dashboard readouts from advisory group members, the CAL seeks wider responses by informal discussions, surveys, web site publications, and email. This continuous assessment and feedback enables mid-stream adjustments which encourage participation by more faculty in discussions. Some results of this process thus far observed include: an apparent reduction in the level of distrust between faculty and ITS staff and administration; a wider appreciation of the roles and responsibilities of faculty, staff and administrators; and increasing cooperation on new projects and an increased focus on incremental progress mutually set and arrived at, consistent with shared expectations of investments, requirements and outcomes.

The CAO and CIO functions have primary responsibility for setting direction and offering incentives and opportunities for experimenting, exploring and testing the ideas that might encourage the campus community to move in a general direction involving effective use of instructional technologies.

The main roles and responsibilities played by the CAL, CAO and CIO with respect to faculty

development involve providing leadership and incentives, the necessary platforms and infrastructure, and requirements and validation.

Faculty will always need and demand discipline-specific hardware, software, technical support, and training opportunities, but it is not necessary or efficient to have redundant support and training systems where replication is high and consistency is low. A role of the CIO and the CAO is to find the right balance between centralized, one size fits all systems and discipline-specific support and training.

Conclusion

In the world of providing a technology solution, success is never simple and it certainly doesn't mean that the job is done. Success tends to promote greater expectations in the future. However, it is clear to many (most?) on our campus that the foundation of a stable, inclusive process for identifying, planning and implementing instructional technology initiatives is in place, and the rate at which progress occurs in the next 3-5 years will be faster, and the results more broadly embraced than ever imagined, provided the principles and processes described here are not subverted.

In regard to technology, our campus discussion must address how well we are doing with respect to technological (informational and instructional) sophistication and progress. In particular, Cal Poly, as an institution, will answer such questions as:

- How can information technology assist Cal Poly to gain/preserve what it most wants/needs in order to be true to its mission and identity?
- How can information technology help Cal Poly not lose what it most needs and wants?

How can information technology strengthen Cal Poly's core institutional characteristics, such as: polytechnic, "learn by doing," undergraduate focus, teaching emphasis, residential, competitive admission, statewide service area, etc.

Exhibit

California Polytechnic State University
San Luis Obispo, CA 93407

Guidelines for Initiatives

Determining which initiatives are appropriate for the campus, setting priorities for initiatives, and carrying initiatives from conception to completion of a project that would evolve from it

I. Background

The purpose of the guidelines for initiatives is to provide a strategic approach for advancing an initiative from its conception through completion of a project that would evolve from it. The initiative process should be used as a mechanism for enhancing productivity, increasing communications, utilizing resources more effectively, and creating a consistent and equitable process for management review, priority setting, and scheduling. The "Guidelines for Initiatives" provides guidelines for turning campus goals into initiatives with follow-up projects. **In order to assure coordination among all campus efforts, the guidelines in this document should be used with all campus initiatives.** The guidelines have been developed with the intent that they will:

- Provide a common set of information from which the campus can evaluate and advise on initiatives that are presented to it for approval/advisement/priority setting.
- Provide a common platform for assessing how a particular initiative advances the campus mission and strategic plan.

- Assist the sponsor of the initiative in understanding the scope of planning and support required to bring an initiative from concept through implementation and on-going operational support.

- Foster communication, collaboration, and coordination on initiatives that can, in turn, add to the benefits and expected outcomes of any given initiative by providing opportunity for others to participate.

II. Planning

A preliminary planning phase should be executed prior to launching an initiative and should include:

- A needs analysis including user or stakeholder input, alternatives explored, and assessment of trade-off with other potential initiatives.
- An assessment of resource requirements for the initiative from beginning to end based on what's known relative to the most likely solution and for on-going annual operations; including quantification and suggested sources.
- Scope, duration, and specific initiative goals and objectives.
- An assessment of how this initiative integrates with existing teaching and learning or business practices and what re-engineering may be needed and necessary to attain the desired results.

III. Campus Integration/Affinity

Initiatives should be actions that move the campus toward the realization of its goals and strategic plans. Proposals should include:

- Description of how the university, college, program, or division benefits from the initiative (both tangible and intangible benefits) with an indication of how the initiative maps to goals and the strategic plan.
- Description of how the initiative integrates with related active and planned initiatives.

IV. Coordination and Participation

Initiatives should be coordinated with the university community and other planned or in-progress related initiatives on the campus. Coordination should include:

- Identification and impact assessment of related initiatives.
- Consideration of a collaborative effort for like initiatives or ones that significantly overlap in goals, scope, and needed resources.
- A strategy for providing the opportunity for all appropriate members of the university to participate in the initiative.
- Before an initiative becomes an active project, it should be approved by all organizations that it will impact.

V. Support Strategies

Each initiative should develop a set of strategies for achieving success including:

- Executive sponsorship and commitment at the highest possible level.
- Inter and intra-departmental commitment, advocates, and support.
- Financial and other resource commitments through university budgets, corporate sponsorships, grants, or generation of outside funding.

VI. Project Life Cycle

Each approved initiative will become a project which should include an iterative set of steps, based on the preliminary planning phase, which includes:

- Project team identification, assignment and responsibilities.
- Refining scope, goals, and objectives based on integrated user/stakeholder needs.
- Initiative specifications.
- Implementation plan, schedule, and budget.
- Coordination with overlapping and inter-dependent initiatives.
- Implementation and project tracking.
- Integration and institutionalization of the initiative results into the teaching, learning, or work environment.
- Assessment of the value of the initiative, continuing operational resource requirements, and opportunities for extending the benefits beyond the original scope.

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VII. Reporting

Periodic reports of performance and progress on approved initiatives shall be provided by the project teams to the appropriate consultative body not less than once each year at or before the spring term. Progress reporting should include:

A. Milestones and benefits achieved within scope of the initiatives as adopted and sanctioned by the consultative body.
B. Changes anticipated to plan, scope, duration, or resources needed.

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Abstract

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